

# **AUTOMATIC CONTRAST COMPENSATION APPARATUS FOR AN ORGANIC LIGHT-EMITTING DIODE DISPLAY**

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## **FIELD OF THE INVENTION**

The present invention relates generally to an organic  
10 light-emitting diode (OLED) and more particularly, to a power-saving automatic contrast compensation apparatus for an OLED display.

## **15 BACKGROUND OF THE INVENTION**

OLED display is gradually popular due to its high brightness and contrast. However, the contrast of an OLED display would decrease when environmental light is strong. To  
20 maintain high contrast, the brightness of the OLED display needs to be adjusted passively by users, which causes increasing of the power consumption of the OLED display and therefore shortens the life of battery. For portable products, such as mobile phone and PDA, it is not convenient for users.

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It is therefore desired a power-saving apparatus for adjusting the display performance of an OLED display.

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## **SUMMARY OF THE INVENTION**

An object of the present invention is to provide a power-saving automatic contrast compensation apparatus for an OLED display, and according to the present invention, which 10 comprises a photo detector, an OLED driver, a safety clamping circuit, and a solar cell. When the intensity of environmental light increases, the photo detector sends a signal to the OLED driver to increase the brightness of the OLED display for improving its displaying performance. Simultaneously, the 15 solar cell provides the extra power for the OLED driver for saving power. The safety clamping circuit limits the current provided by the solar cell to the OLED driver for over-current protection.

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## **BRIEF DESCRIPTION OF DRAWINGS**

These and other objects, features and advantages of the present invention will become apparent to those skilled in the art upon consideration of the following description of the 25 preferred embodiments of the present invention taken in

conjunction with the accompanying drawings, in which:

Fig. 1 shows the first embodiment of the present invention;

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Fig. 2 shows the second embodiment of the present invention; and

10 Fig. 3 shows the third embodiment of the present invention.

## **DETAILED DESCRIPTION OF THE INVENTION**

15 [First embodiment]

Fig. 1 shows a preferred embodiment of the present invention, in which an automatic contrast compensation apparatus 11 comprises a photo detector 12, an OLED driver 14, 20 a safety clamping circuit 16, and a solar cell 18. When the intensity of light source 10 increases, the photo detector 12 detects the enhanced light intensity and sends a signal to the OLED driver 14 to increase the brightness of OLED panel 15. Simultaneously, the solar cell 18 provides the extra energy 25 resulted from the increased brightness of the OLED panel 15 by

the OLED driver 14. The safety clamping circuit 16 can avoid the current from the solar cell 18 too much to damage system in blaze.

5 [Second embodiment]

Fig. 2 shows another embodiment of the present invention by an automatic contrast compensation apparatus 21 that comprises a switch 22, an OLED driver 24, a safety 10 clamping circuit 26, and a solar cell 28. When the intensity of light source 20 increases, the switch 22 is actively or passively turned on to send a signal to the OLED driver 24 to increase the brightness of OLED panel 25. Simultaneously, the solar cell 28 provides for the power consumption to increase the brightness 15 of the OLED panel 25 by the OLED driver 24. The safety clamping circuit 16 can avoid over-current from the solar cell 18 to damage system in blaze.

[Third embodiment]

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Fig. 3 shows a further embodiment of the present invention. A power-saving automatic contrast compensation apparatus 31 comprises a switch 32, an OLED driver 34, and a solar cell 36. When the intensity of light source 30 increases, 25 the switch 32 is actively or passively turned on to send a signal

to the OLED driver 34 to increase the brightness of OLED panel 35. Simultaneously, the solar cell 36 provides the power for the increased brightness of the OLED panel 35 to the OLED diver 34.

5           While the present invention has been described in conjunction with preferred embodiments thereof, it is evident that many alternatives, modifications and variations will be apparent to those skilled in the art. Accordingly, it is intended to embrace all such alternatives, modifications and variations  
10          that fall within the spirit and scope thereof as set forth in the appended claims.